

# *The Heterodyne*

*Newsletter of the West Valley Amateur Radio Association*

## **June Meeting**

***Tips on Contesting  
by Jack Brindle, W6FB***

**Wednesday, June 12  
Meeting Starts at 7pm**

Meeting Location:  
American Red Cross,  
Silicon Valley Chapter  
2731 N. First Street at Plumeria Dr  
(southwest corner) in San Jose

<b>WVARA Repeaters (W6PIY)</b>		
<b>Band</b>	<b>Frequency</b>	<b>PL</b>
6 Meters	52.580- MHz	151.4 Hz
2 Meters	147.39+ MHz	151.4 Hz
1.25 Meters	223.96- MHz	156.7 Hz
0.70 Meter	441.35+ MHz	88.5 Hz
0.23 Meter	1286.2- MHz	100 Hz

## **Club Net**

WVARA's club net is on the W6PIY repeaters each Tuesday at 8:30 pm. All repeaters are linked together during the net. The net script can be found at [www.wvara.org/net.html](http://www.wvara.org/net.html).

***Visitors Are Welcome!***

## **President's Letter**

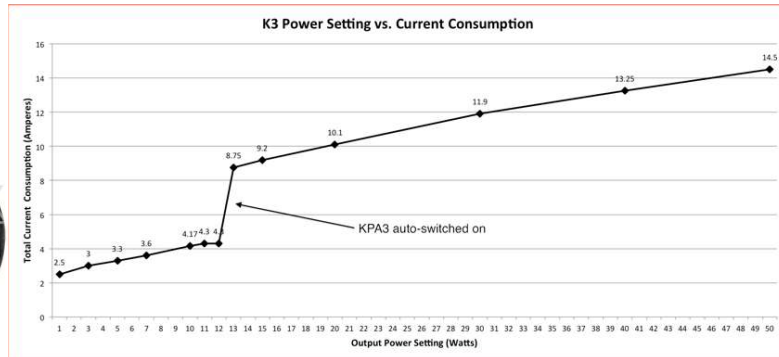
### **Field Day Power (and other interesting ideas)**

A common problem for Field Day is knowing you have enough DC power for the weekend. You have radios, phones, fans, and more you need to power – and you aren't yet sure how to make sure you are limited by signals or the team's ability to stay awake, not by power availability. For this exercise, we'll assume the standard WVARA method of using QRP, solar, and batteries. We can discuss generators and higher power another time. Let's walk through both halves of the equation: consumers and sources, though my thoughts will definitely wander along the way.

For the **power consumers**, there are three basic categories: radio, laptop, and other stuff (lights, fans, phone charger, etc). You can easily put an ammeter on the 12v supply line of any item to determine consumption. I use a few different versions of the same basic power meter. You can find them on Powerwerx.com or other variants on Amazon or eBay.



Whatever you use, put PowerPole connectors on, so you can keep an eye on things at the event. Plug one of these in to your radio supply line and see what you get when you put the key down at 5 W RF output. W9XC has already done this for the Elecraft K3 (<http://w9xc.net/w9xc-html-site/articles/k3-measured-power-consumption.html>) and the answer is 3.3 A at 5 W AND 1.12 A in receive mode. If you assume CW and SSB both have a basic duty cycle of 60%, because there *\*are\** spaces in those quick dots and dashes, and you *\*do\** pause between words. In both cases, the RF output is 0 W. You are also transmitting about a third of the time. The rest you are receiving. Let's run a worst case estimate of 50/50. So now we have  $(3.3 * .5 + 1.12 * .5) = 2.21$  A on average for the radio.



PowerWerx meter

W9XC Current Consumption Chart for K3

Laptops are a little different. If they are in charge mode, you can bet they'll charge at whatever the rating of your charger is (typically 65-85 W, or 5-7 A). When they are just running normally with a full battery, they're more like 1.5-2 A, depending on the technical details of your laptop and the screen brightness setting (which has a big impact). The message here is: charge it up at home before the event – don't bring it up to the hill with 20% battery left. I've also got 2 different cigarette lighter USB-C chargers for my Mac laptop, which both work fine. This will eliminate the need for a 110 VAC inverter, which is often a great source for HF noise, more than AC power. One of my 12 V chargers was used last year with no RF complaints. The other hasn't yet been tested. Both came from Amazon.com.

The other items that you'll want to have are lights, fans, and a charger for your phone. The lights should have AA or AAA batteries of their own. I use Eagle Nest Outfitters "Twilights", which use 3xAAA batteries and will last all weekend and more on one set, so no impact to your primary battery needs. They sell them at all the major online retail shops.

There are many options for fans:

- 1- Small squirrel cage fans from eBay. I use a pair of these that I put PowerPole ends on in place of the cigarette plug. Search for "12v portable fan blower" on eBay and you'll find some orange fans that are about the size of two fists. They work well and only draw a partial amp at low speed.
- 2- DeWalt has a much larger fan (~10" diameter blades), but it puts out a lot more air. It uses DeWalt batteries, which I'm sure we could recharge there somehow, but you'll want to bring a charger to plug into the van or Svend's truck. You can see where the battery

fits in below. I used one for several hours at Henry Coe's Backcountry Weekend and it did a great job.

- 3- The ultimate in cooling you off (shy of a full size air conditioner) is a mister. If it's really hot out, this does help, but you'll need to watch out where you put it or risk getting everything wet (not great). The 5 gallons lasted me all through the hot part of Saturday (4-5 hours), and so did one battery. Here is what they look like, and you can get them at places like Home Depot for about \$100, including battery and charger. No impact to your power budget.



eBay Squirrel Cage Fan



DeWalt Fan



Home Depot Mister

A phone charger will consume exactly what the charger rating claims (5 W or 10 W USB are the most common). I just include this in some rounding up somewhere, as it will only be on charge for an hour or two each day, and will consume a bit less than an amp when it is.

So, to recap: 2.21 A for the radio, 2A for the laptop, and then we can just round up for the other stuff. That means you should be about 5 A on average. You can tweak this any way you like to accommodate other items (HT chargers? Different radio?).

Now for the **power sources**. You'll want to charge with at least twice your normal consumption rate, with the sun setting on fully charged batteries. If you wake up with low, but not very low, batteries (at least 12.0-12.3 V), you should be ok. Doubling our earlier estimate of 5 A to arrive at a 10 A charge rate will be about 130-140 W of panel (10 A \* 12 V is 120 W, but the chargers are only about 90-92% efficient). Many folks do pretty well with a single 100 W solar panel, since you don't need to run forever. Once 11am hits on Sunday morning, it's pencils down.

I've gotten mine from a company called "Eco-Worthy" off of eBay. The particular model you may have seen by the VHF tent is: <https://www.eco-worthy.com/catalog/worthy-100w-foldable-polycrystalline-solar-suitcase-p-347.html> and they have lots of others to choose from to meet your needs, larger and smaller. I'd really like to start playing with their flexible panels, since they are generally more durable and lighter. I'm just not yet sure how to package or mount them.

Charge controllers come in a variety of versions, with a variety of efficiencies and costs. I use mine pretty often, so I picked an MPPT version that I have been very happy with. They are the EPEVER Tracer series. They come in 10 A, 20 A, and 40 A versions. The outgoing versions also power limit the battery output to their rating instead of shutting down and alarming, in case you

have more panel then is needed (the model prior to that did not). Add on the MT-50 monitor (lower left in the image below) and mount it all down to a piece of wood, and you have an easily portable and monitorable charge controller. I haven't tried their very newest models yet.

Keep the wire length between the charge controller, battery, and your gear as short as is reasonable and with some decent #10 wire (PowerWerx has great stuff) with PowerPoles. Losing just 0.1 V across some thin wire can be VERY frustrating at 4am when the battery is getting low. You can run a longer wire to the solar panel to allow for some placement flexibility. If you are running a couple of panels in series, the voltage can be 40-50 VDC, so be careful **not** to plug that into your radio. However, since the current will be much lower, you can get away with #12 or #14 wire (cheaper and smaller) between the charge controller and the solar panel and still be pretty efficient. My favorite fuse block (always fuse your gear!) is the RigRunner 4004U. It has all the spots you'll need for one typical radio setup, and it has two USB ports to charge your phone or whatnot.



EPEVER Tracer 2215BN w/ MT-50



RigRunner 4004U Fuse Block

To get through the night, which we'll estimate at 12 hours of non-optimal solar charging time, you'll want as much as  $5\text{ A} * 12\text{ V} = 60\text{ Amp*hours}$  of battery capacity. A good condition, full size car battery comes in around 80-90 Ah, and lead acid batteries really only like to be discharged about 60% of their rated value before getting too low to make radios happy. Therefore, a 90 Ah battery \* 60% = 54 Ah, which is good enough, since we don't need to operate non-stop forever. Show up with a fully charged battery and you should be ok. One car battery and you're good for one typical station. This is what we typically use per SSB or CW station. Digital and VHF have different (and larger) needs. I bring 300 Ah of battery to the VHF tent and it works out about right. Digital may need more than that this year with two stations running hard.

In any case, be sure to try it all out and test it prior to the big day. Run the battery down and see what your full charging current really is. If you have any questions, send me a note. I'd be glad to share ideas or help where I can.

May your noise floor be low and your signals strong,  
Bobby Barnett  
K0XI

**WVARA Treasurer Reports and BOD Minutes are  
posted at the Members Only page at [www.wvara.org](http://www.wvara.org)**

<b>WVARA Net Check-Ins (W6PIY)</b>						
<b>Tuesdays at 8:30 PM</b>						
<b>Call Sign</b>	<b>Name</b>	<b>05/07/19</b>	<b>05/14/19</b>	<b>05/21/19</b>	<b>05/28/19</b>	<b>06/04/19</b>
<b>Total</b>		<b>14</b>	<b>12</b>	<b>14</b>	<b>9</b>	<b>11</b>
AB6XS	Kevin			X		
AE6JV	Bill			X		
AF6AE	Bill	X	X	X		X
AG6YO	Kevin	X	X		X	
AI6NT	Henry	X				X
K6QFO	Mike					X
KC6ZKT	Steve		X	X		X
KF6EMB	Svend	X	X	X	X	
KI6SLX	Peri			X		
KK6EBL	Klouse				X	
KK6VF	Kevin	NET	NET	NET	NET	NET
N6BTU	Wayne	X	X	X	X	X
N6FYR	Matt	X	X			
N9CU	Andy	X		X		X
W6BG	Max			X		
W6BP	Bob					X
W6ESL	Tom	X	X		X	
W6FDU	Ben		X			
W6IA	Mark	X	X	X	X	X
W6PK	Phil					X
W8RJL	Ron	X				
WB6KHP	Dave	X	X	X	X	X
WJ6JW	John	X	X	X		
WR3K	Greg	X		X	X	

## **2019 West Valley Amateur Radio Association Board**

President: Bobby Barnett, K0XI  
 Vice President: Bill Ashby, N6FFC  
 Secretary: Mark Sayre, W6IA  
 Treasurer: Peri Frantz, KI6SLX  
 Directors:  
 Chuck Kamas, AD6CL, 2018-2019  
 John Glass, NU6P, 2018-2019  
 Dave Schultheis, WB6KHP, 2018-2019  
 Jim Peterson, K6EI, 2019-2020  
 Bill Frantz, AE6JV, 2019-2020  
 Kevin Smith, KK6VF, 2019-2020

The Heterodyne is published monthly by the West Valley Amateur Radio Association and sent to all club members via the web. Please obtain permission from the author to re-publish any article in this publication.

Club Web Page: [www.wvara.org](http://www.wvara.org)  
 Heterodyne Editor: Phil Verinsky, W6PK  
 Internet Postmaster: Phil Verinsky, W6PK  
 Meeting Refreshments: Kevin Smith, KK6VF  
 Repeater Trustee: Chuck Kamas, AD6CL  
 Webmaster: Larry Goodwin, KG6ENF

Speaker Committee:  
 John Glass, NU6P  
 Scott Emery, AD6RY  
 Jim Peterson, K6EI  
 Jon Kelley, K6WV  
 Phil Verinsky, W6PK

DX Special Interest Group:  
 Dennis Lyden, AG6HE

Club address:  
 West Valley Amateur Radio Assn  
 P.O. Box 6544  
 San Jose, CA 95150-6544